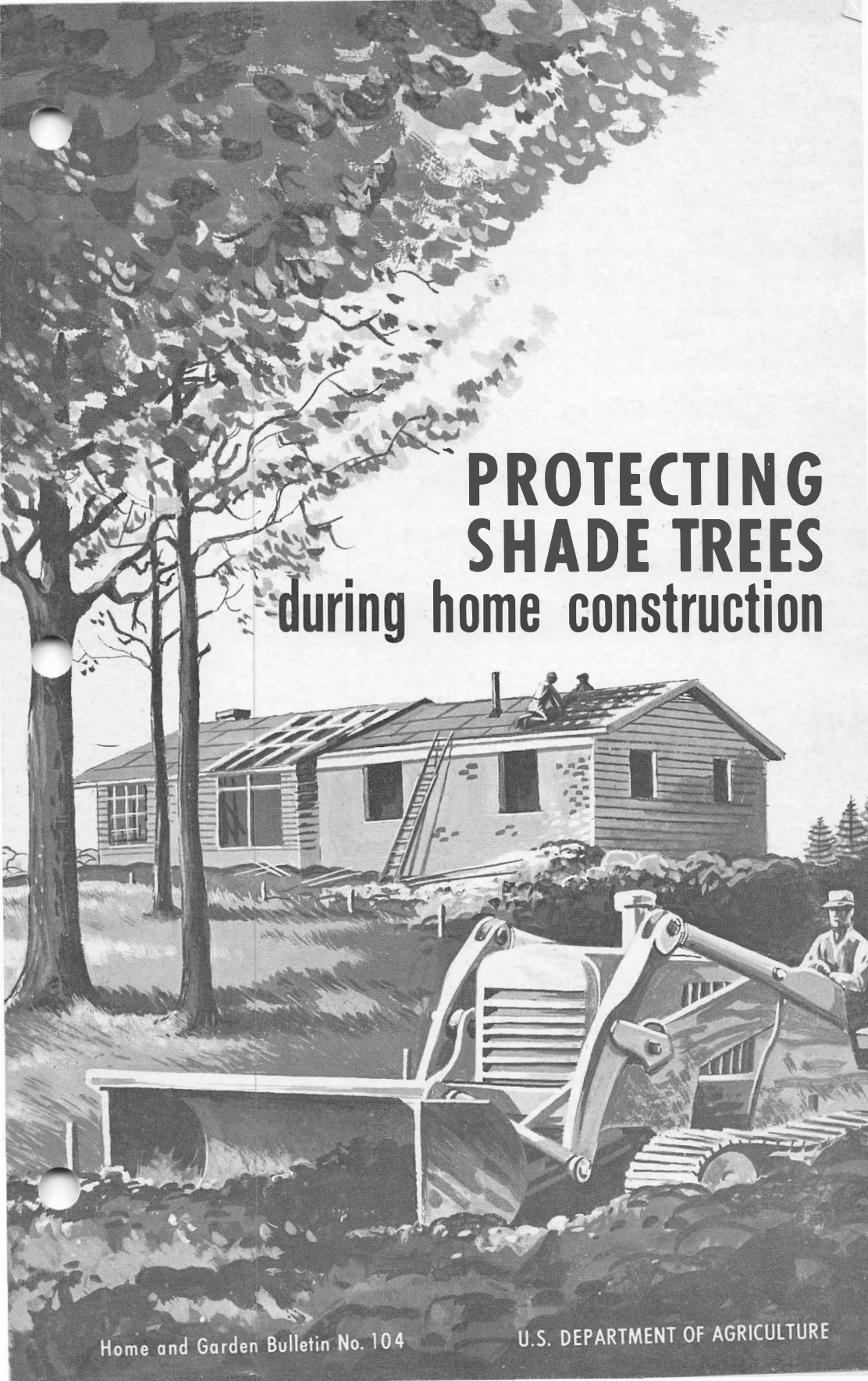


PROTECTING SHADE TREES during home construction

Home and Garden Bulletin No. 104

U.S. DEPARTMENT OF AGRICULTURE

TREE PRUNING

Information on tree pruning and wound dressing will be found in Home and Garden Bulletin 83, "Pruning Shade Trees and Repairing Their Injuries." To obtain a copy, send a postal card to the U.S. Department of Agriculture, Washington, D.C., 20250.

replacing it is often cheaper than preserving it.

- A young tree may be the right size for your landscape now, but it may become too large for its location by the time it matures. Often, a young tree located near a building, walk, or driveway will need extensive pruning to keep it in bounds. It may even need to be removed at a later date.
- The length of annual twig growth, the number of dead branches, and the size and color of the leaves are indications of health and vigor. Compare the tree with other trees of the same species.

WHAT PROTECTION IS NECESSARY?

When you have evaluated the trees on your property, you may decide to keep only a few of them—those that are ideally located, are vigorous, have desirable characteristics, and require a minimum of protection to save them. You will want to remove those that fall short of these requirements.

Remove the trees you don't want, and those that are not worth saving, before the construction work begins. Experienced arborists, or tree surgeons, can remove them so that the remaining trees will not be damaged.

The trees that you want to save will have to be protected from damage resulting from one or more of the following:

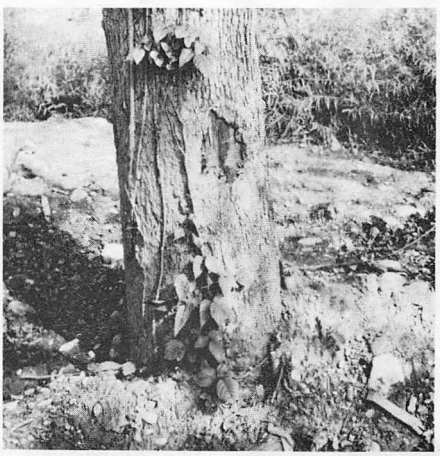
- Construction equipment and supplies.
- Grade changes—either raising or lowering.
- Excavations for sewer and water lines.

They will also have to be protected during cleanup after the construction of your house is finished.

Protection From Mechanical Injury

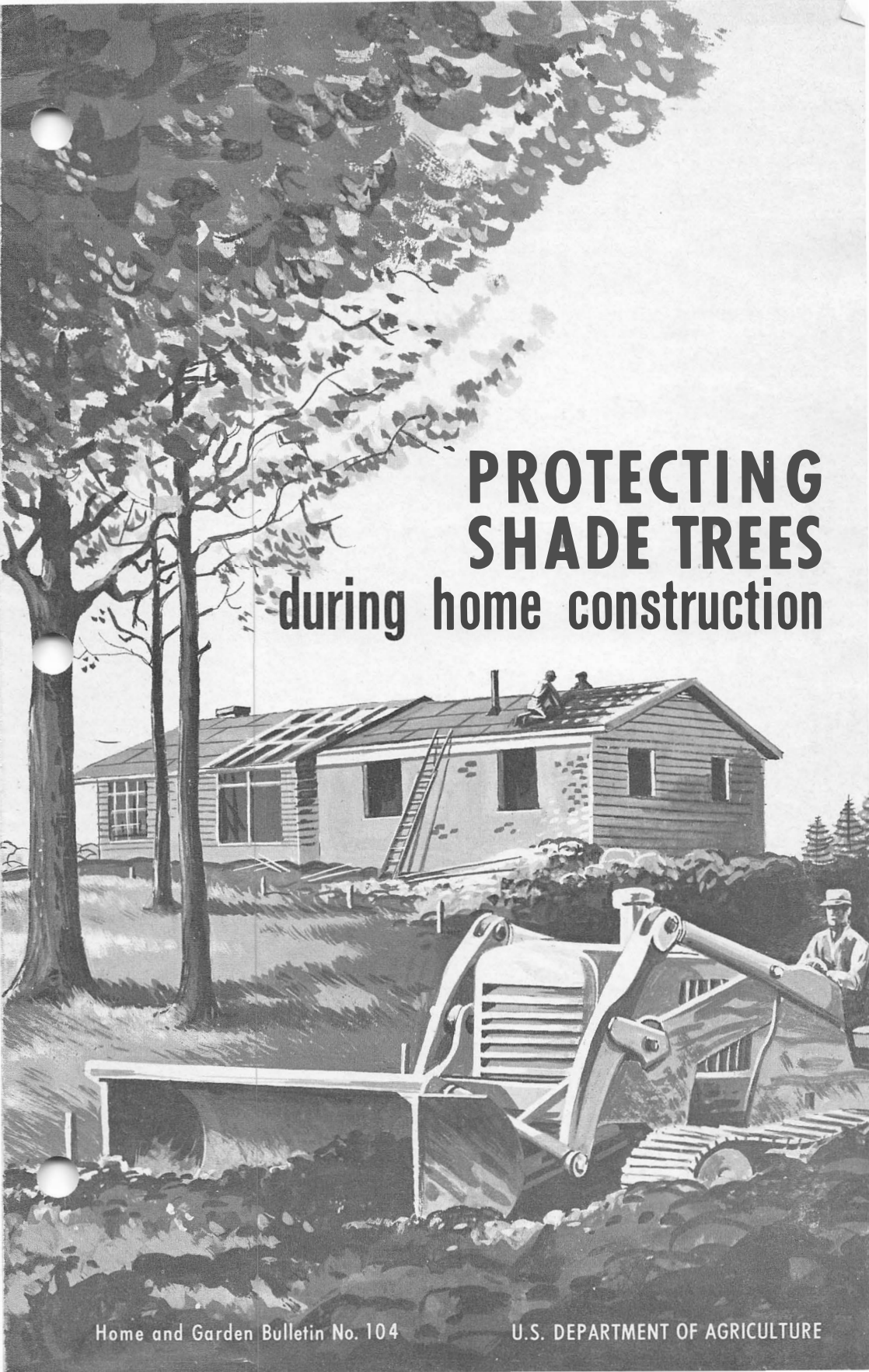
If the soil around the tree will not be disturbed during construction, protection from mechanical injury may be all that is required.

Construct a simple fence, or similar barrier, around the tree to prevent equipment and vehicle injury



BN–22075

Tree trunk wounded by construction equipment.



PROTECTING SHADE TREES during home construction

Home and Garden Bulletin No. 104

U.S. DEPARTMENT OF AGRICULTURE

PROTECTING SHADE TREES DURING HOME CONSTRUCTION

Information for this publication was furnished by the
Plant Science Research Division, Agricultural Research Service

Should trees be removed from residential property before home construction? Or should they be saved?

Shade trees can add thousands of dollars to the value of residential property—yet homebuilding contractors often remove them before starting construction.

Many trees can be saved with little effort or expense; many are valuable enough to justify considerable effort and expense in protecting them.

But some trees are worth less than their owners realize. And the owners spend more to protect the trees than is warranted, or they suffer unnecessary anguish when the trees are destroyed.

How can you tell if a tree on your lot should be saved? You will have to evaluate the tree—is it really worth saving?—and you will have to decide what type of protection will be necessary to save it.

How much will it cost? That depends on the amount and type of protection. There are no shortcuts to good protection; you can't halfway protect a tree and expect it to survive.

IS THE TREE WORTH SAVING?

You can decide which of your trees to save by evaluating each one of them carefully. First consider their location, their species, and their size, age, and vigor. Then consider the cost and work involved in protecting them.

A more comprehensive discussion of this subject appears in Agriculture Information Bulletin 285, "Protecting Trees Against Damage From Construction Work." It is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 20402, at 15 cents per copy.

Location

Consider the location of each tree with respect to where it will fit in the landscape when the house is built. Ask yourself these questions about the location of each tree:

- Will a tree in this location provide shade where I want it? Or will it shut off the sunlight I need for my lawn and garden?
- Will it protect my home by breaking the force of cold winter winds? Will it prevent the circulation of cooling summer breezes?
- Will it hide an unpleasant view? Will it block out a desirable view?
- Will roots later crack sidewalks or driveway?
- If no tree were growing in this spot, would I plant one here?

Species

Consider the species of each tree. Is it a desirable species? Is it the kind of tree you would buy?

Do the roots of the tree grow close to the surface? Some trees—for instance, maple, linden, and dogwood, and most conifers—often have roots that grow close to the surface of the soil. Lawns and some kinds of ornamental shrubs have a hard time surviving under these trees.

Some trees—willows, for instance—are notorious for blocking sewerlines with their roots.

Some trees are attacked by insects in ways that make them undesirable. For example, maples frequently are attacked by aphids that exude a sticky liquid. Such a tree near a driveway is a nuisance; the liquid drips onto cars and sticks.

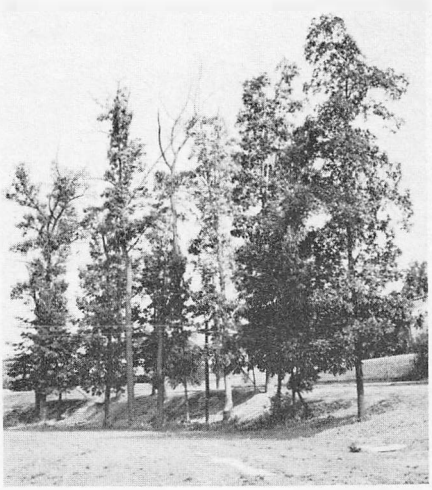
Other trees are susceptible to diseases—Dutch elm disease, for example—and if the disease occurs nearby, the tree is a poor risk unless you are willing to give it continuous protection against the disease.

Some species, even with careful and expensive protection, will not survive environmental changes for long. Species that adapt well to change include elm, poplar, willow, planetree, and locust. Those less adaptable include beech, birch, hickory, tulip tree, some oaks, most maples, and most conifers.

Size, Age, and Vigor

Keep these points in mind when you evaluate the size, age, and vigor of your trees:

- Old trees do not adapt as well to changes in environment as young trees of the same species. Neither, generally, do large trees.
- A small tree is easily replaced;



BN–22071

The white oak on the right is the only tree in this group that is vigorous enough to save.

TREE PRUNING

Information on tree pruning and wound dressing will be found in Home and Garden Bulletin 83, "Pruning Shade Trees and Repairing Their Injuries." To obtain a copy, send a postal card to the U.S. Department of Agriculture, Washington, D.C., 20250.

replacing it is often cheaper than preserving it.

- A young tree may be the right size for your landscape now, but it may become too large for its location by the time it matures. Often, a young tree located near a building, walk, or driveway will need extensive pruning to keep it in bounds. It may even need to be removed at a later date.
- The length of annual twig growth, the number of dead branches, and the size and color of the leaves are indications of health and vigor. Compare the tree with other trees of the same species.

WHAT PROTECTION IS NECESSARY?

When you have evaluated the trees on your property, you may decide to keep only a few of them—those that are ideally located, are vigorous, have desirable characteristics, and require a minimum of protection to save them. You will want to remove those that fall short of these requirements.

Remove the trees you don't want, and those that are not worth saving, before the construction work begins. Experienced arborists, or tree surgeons, can remove them so that the remaining trees will not be damaged.

The trees that you want to save will have to be protected from damage resulting from one or more of the following:

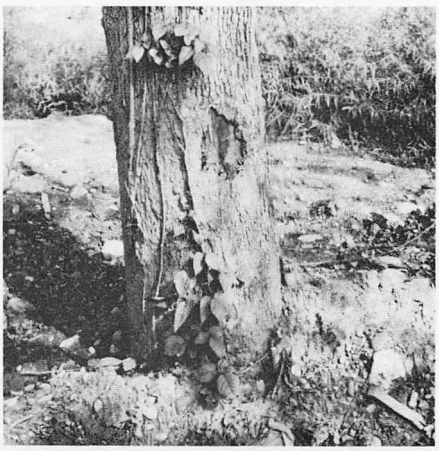
- Construction equipment and supplies.
- Grade changes—either raising or lowering.
- Excavations for sewer and water lines.

They will also have to be protected during cleanup after the construction of your house is finished.

Protection From Mechanical Injury

If the soil around the tree will not be disturbed during construction, protection from mechanical injury may be all that is required.

Construct a simple fence, or similar barrier, around the tree to prevent equipment and vehicle injury



BN–22075

Tree trunk wounded by construction equipment.

to trunk, roots, and low-hanging branches.

Enclose an area at least 10 feet square with the tree in the middle. All exposed roots should be inside the fence. This will prevent vehicles from packing the soil above the roots.

Groups of trees don't have to be fenced individually. Where you want to save a group of small trees or shrubs, fence the entire area.

Protection From Grade Changes

There are two types of grade changes, and trees have to be protected from both. One is raising the grade; the other is lowering it.

Tree roots need air, water, and minerals to survive. When the grade level is changed by removing soil from the top of the roots or by adding soil over the top of the roots, the tree has difficulty obtaining its normal amount of air, water, or minerals.

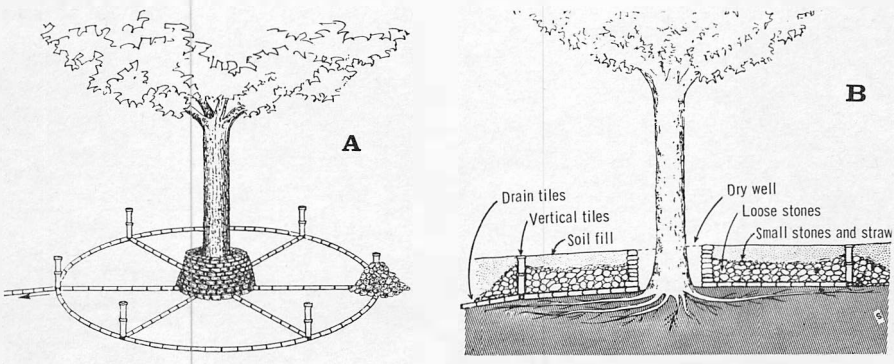
GET HELP

If you decide that a tree that must be subjected to grade changes is healthy and valuable enough to justify the expense of saving it, you may wish to get professional help. Ordinarily, construction workers lack the specialized knowledge necessary to give trees good protection. The best assistance can be obtained from landscape architects, arborists (or tree surgeons), nurserymen, foresters, or your county agricultural agent.

Raising the Grade

Fill added around the base of a tree blankets the roots and prevents normal air and moisture circulation in the original soil.

Minor fills—6 inches or less in depth—will not harm most species of trees if the fill is made with good topsoil that is high in organic matter and loamy in texture.



A tile system protects a tree from a raised grade. *A*, The tile is laid out on the original grade, leading from a dry well around the tree trunk. *B*, The tile system is covered with small stones to allow air to circulate over the root area.

Major grade changes will require you to supply air to the roots of the tree. This is usually done by installing a layer of gravel and a system of drain tiles over the roots of the tree. The tiles are laid on the original grade; they form a wagon-wheel shape with the spokes of the wheel opening into a dry well that is built around the tree trunk. The dry well acts as the hub of the tile system and holds fill away from the tree trunk.

Also, it may be necessary to place a series of bell tiles vertically over the roots and connected to the wagon-wheel system to allow for additional air and water circulation.

The air system will have to be designed for each tree individually, and it will have to fit the contour of the land so that it drains water away from the tree trunk.

Lowering the Grade

Protecting a tree from a lowered grade is usually less complicated than protecting it from a raised grade. But it can be equally harmful to the tree unless proper attention is given to cutting roots, pruning branches, stimulating root growth, and watering.

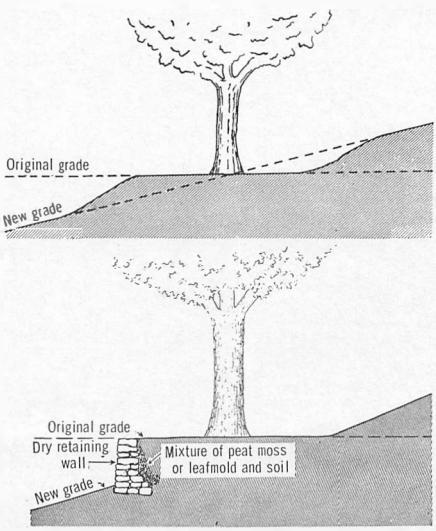
Generally, protection is achieved by terracing the grade. If space is available, the tree may be unharmed if you let it remain on a gently sloping mound.

Another way to protect it from a lowered grade is to build a retaining wall between it and the lower grade. This is an effective way to save a tree if the grade difference is less than 2 feet.

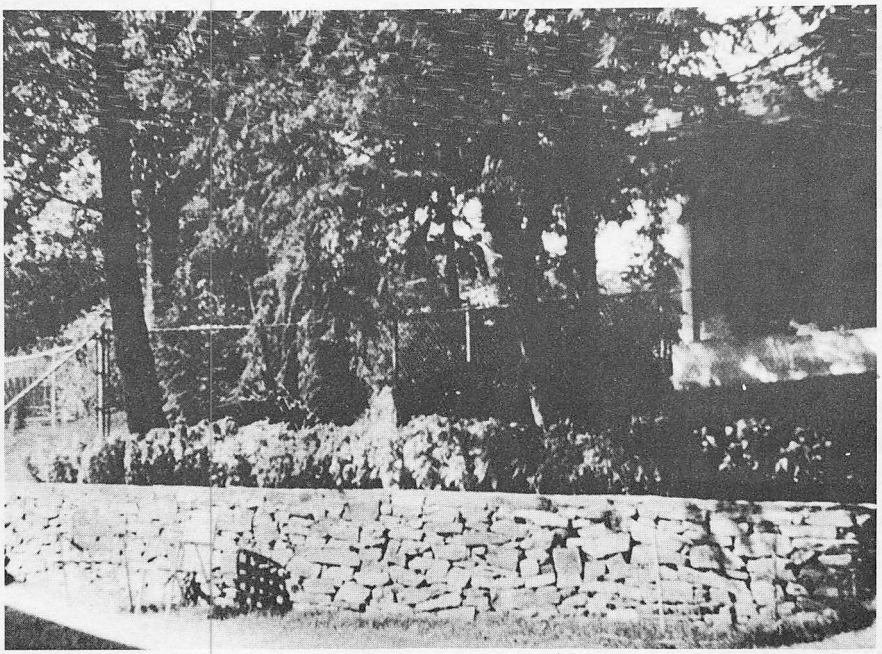
Retaining walls can be laid dry or with mortar. If you lay a wall with mortar, you will have to put a footing under it for stability. And don't forget to leave drain holes in the wall.

BN—22074

Tree roots damaged by lowering the grade.



A retaining wall protects a tree from a lowered grade.



BN—22250

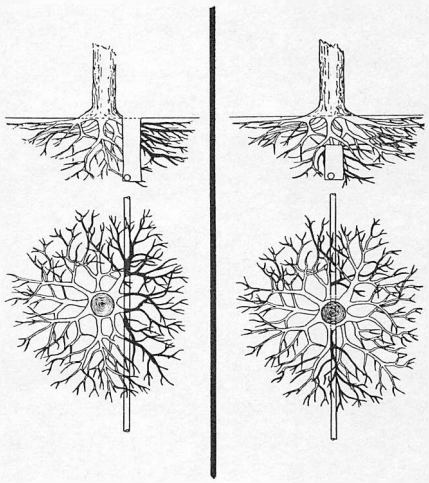
A retaining wall protects tree roots when the grade must be lowered.

Protection From Excavations

Trees can be protected when you excavate for water and sewer lines. Start by considering the location of the trenches. If you cannot route the trenches around the trees, the next best thing is to tunnel under them. Power-driven soil augers are often used for this purpose.

If you must pass by the side of a tree, however, follow these rules:

- Cut as few roots as possible.
- When you have to cut them, cut them cleanly.
- Paint cut root ends with a wound dressing, like asphalt-base paint.
- Backfill the trench as soon as possible---don't leave the roots exposed to air.



Tunnel beneath root systems. Drawings at left show trenching that would probably kill the tree. Drawings at right show how tunneling under the tree will preserve many of the important, feeder roots.

Protection During Cleanup

Cleanup after construction can be a critical time for tree damage. Generally everyone involved is in a hurry. Here are some hints for protecting the trees you have saved thus far:

- Insist that the fences and barriers around the trees be removed last—after everything else is cleaned up and carried away.
- Have all debris hauled away rather than buried or burned on the site. If you cannot have the trash hauled away, burn it in an area where the flames and heat cannot reach tree branches, bark, or roots. First check local burning regulations.

MOVING TREES

You may discover that the only way to save a certain tree—for instance, one that is on a construction site—is to move it.

The easiest trees to move are surface-rooted ones. Maples, elms, lindens, dogwoods, and conifers are examples.

For greatest success and safety, consider engaging an arborist, or tree surgeon, to do the actual moving; he has both the experience and the proper equipment.

This bulletin supersedes Farmers' Bulletin 1967, "Reducing Damage to Trees From Construction Work."

Washington, D.C.

Issued April 1965
Slightly revised July 1971

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402 - Price 10 cents

U.S. GOVERNMENT PRINTING OFFICE: 1970—O-380-259